Transitionen von der Erstausbildung ins Erwerbsleben
Transitions de l'Ecole à l'Emploi
Transitions from Education to Employment

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The Swiss TREE multi-cohort survey in its 20th year: design issues, research potential, and some selected findings

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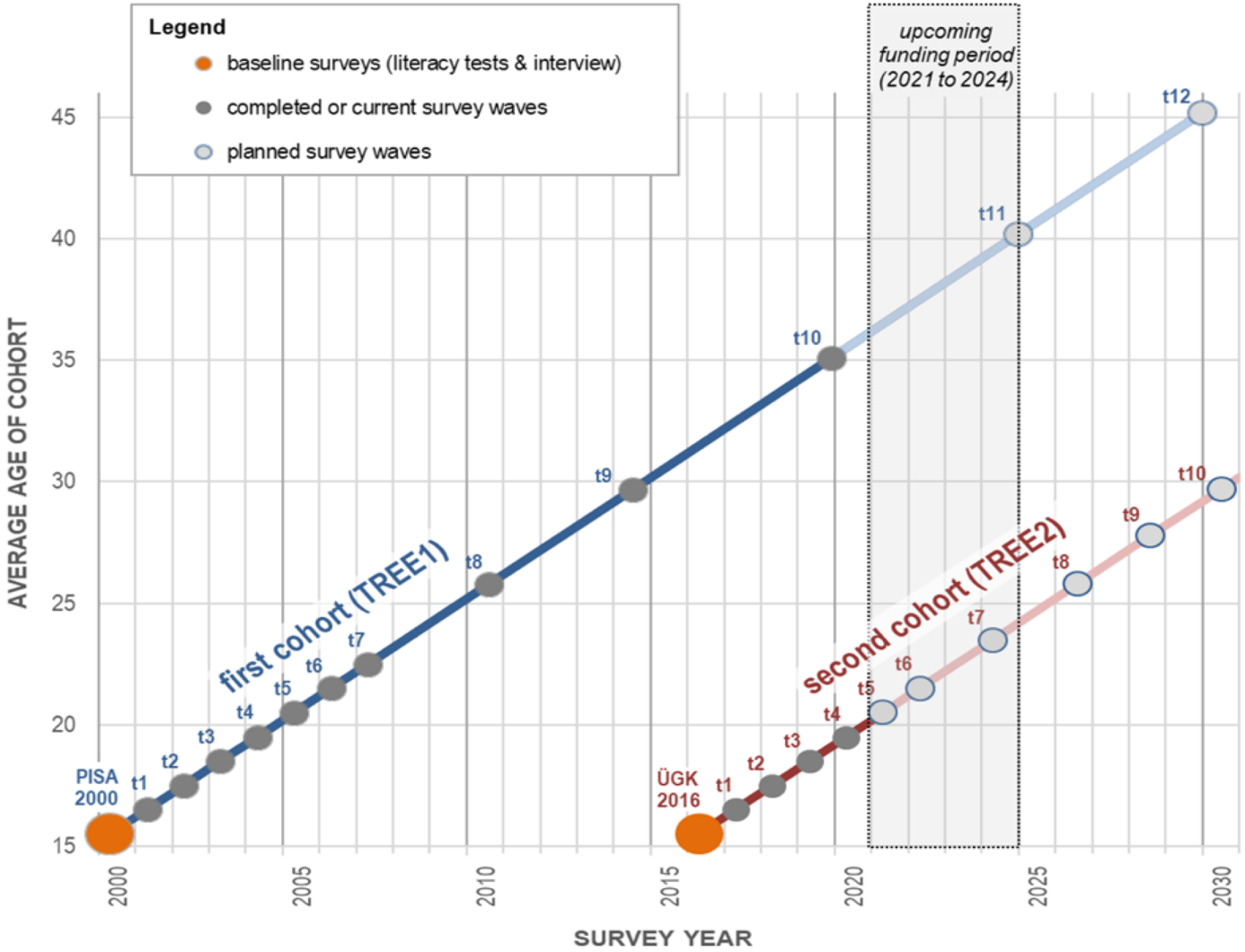
Study & survey design

Study design



Survey design & response rates 1st cohort (TREE1)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Ø age of sample	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Transition progress of sample	End of compulso-ry school	Transitions from lower sec. to upper sec.				Transitions from upper sec. to tertiary level or labour market			Transitions from tertiary level to labour market or consolidation of labour market entry						
Surveys	PISA 2000	TREE panel 1	TREE panel 2	TREE panel 3	TREE panel 4	TREE panel 5	TREE panel 6	TREE panel 7			TREE panel 8				TREE panel 9
Sample size and response rates	valid sample	6'343	5'944	5'605	5'344	5'048	4'852	4'665			4'571				4'404
	response absolute	5'532	5'210	4'880	4'680	4'507	4'138	3'953			3'424				3'143
	% response/panel	87%	88%	87%	88%	89%	85%	85%			75%				71%
	% response total	87%	82%	77%	74%	71%	65%	62%			54%				50%

Particularities of the dataset (TREE1)

- Detailed longitudinal data on education and labour market pathways over 20 years (age 16-35);
- Standardised literacy skills assessment at baseline (PISA)
- Abundant context data
- Representative for a Swiss school leavers population at national and regional/cantonal levels;

Survey instruments

- Detailed (month by month) collection of education, labour market & other activities
- Context data:
  - socio-demographic data (e.g. SES, migrations background),
  - personality & non-cognitive skills scales (e.g. coping, persistence, etc.)
  - resources & strains
  - values
  - health & well-being
  - critical life events
  - aspirations & plans
  - financial & home/residential situation
  - children, partner, child care situation (as of T8/2010)
- Cognitive skills measures at baseline (PISA or ÜGK scores, marks)

Survey methods

Mixed mode

- CATI interview approx. 20min
  (secondary mode: P&P, CAWI [in preparation])
- self-administered (complementary) questionnaire 20-30 minutes (CAWI/P&P), adapted/customized on the basis of CATI data (e.g. student, apprentice, employee questionnaire);

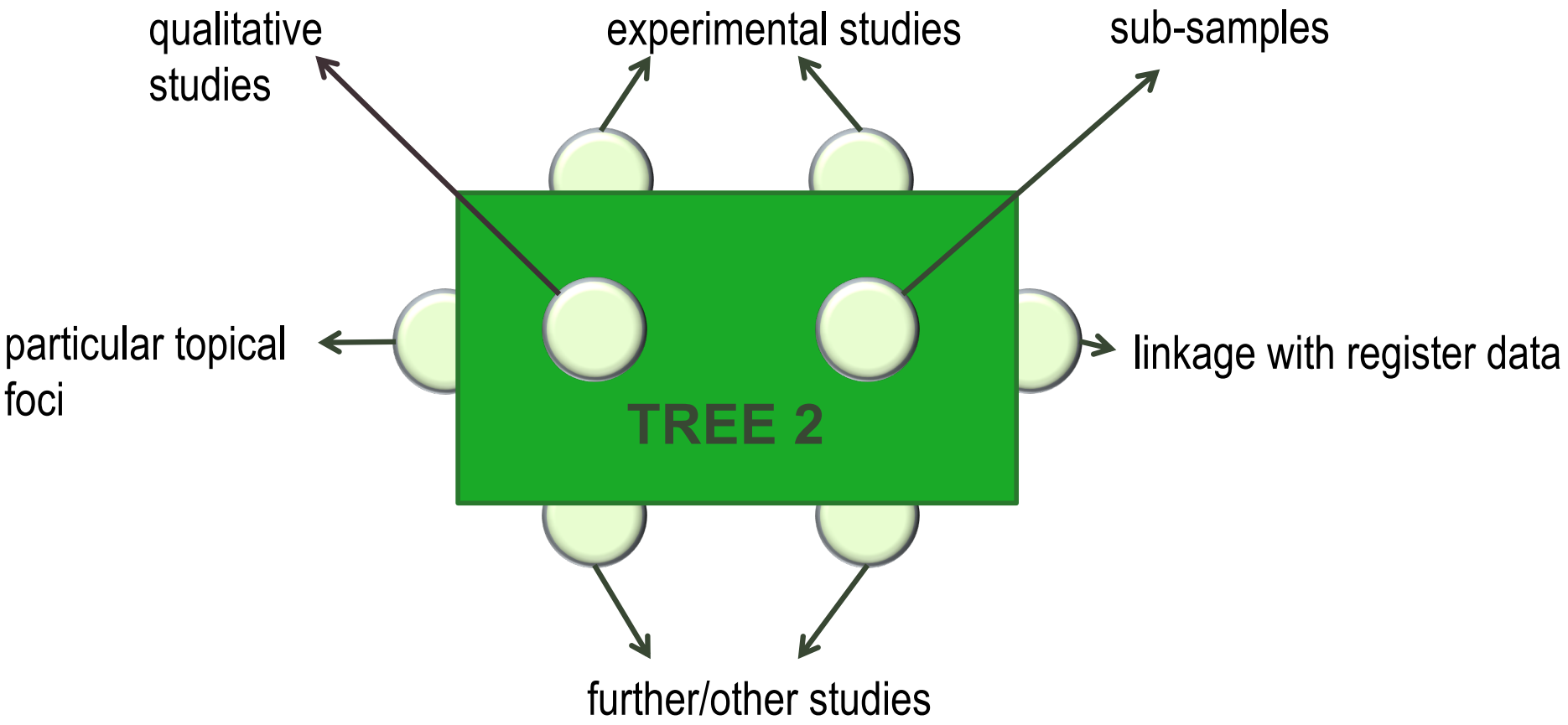
Data availability (TREE1)

- 9 waves, observation span of 14 years (2000 to 2014; age 16 to 30)
- Episodic data on all job episodes 2003 to 2014
- Available to the scientific community at large,
  online & free of charge (at FORS center/FORSbase, Lausanne)
  https://forsbase.unil.ch/project/study-public-overview/13923/0/
- 10th wave (at ø age 35) to be concluded by mid-2020;
  expected response approx. 3.000 cases
- Data of 10th wave available by 2nd half of 2021

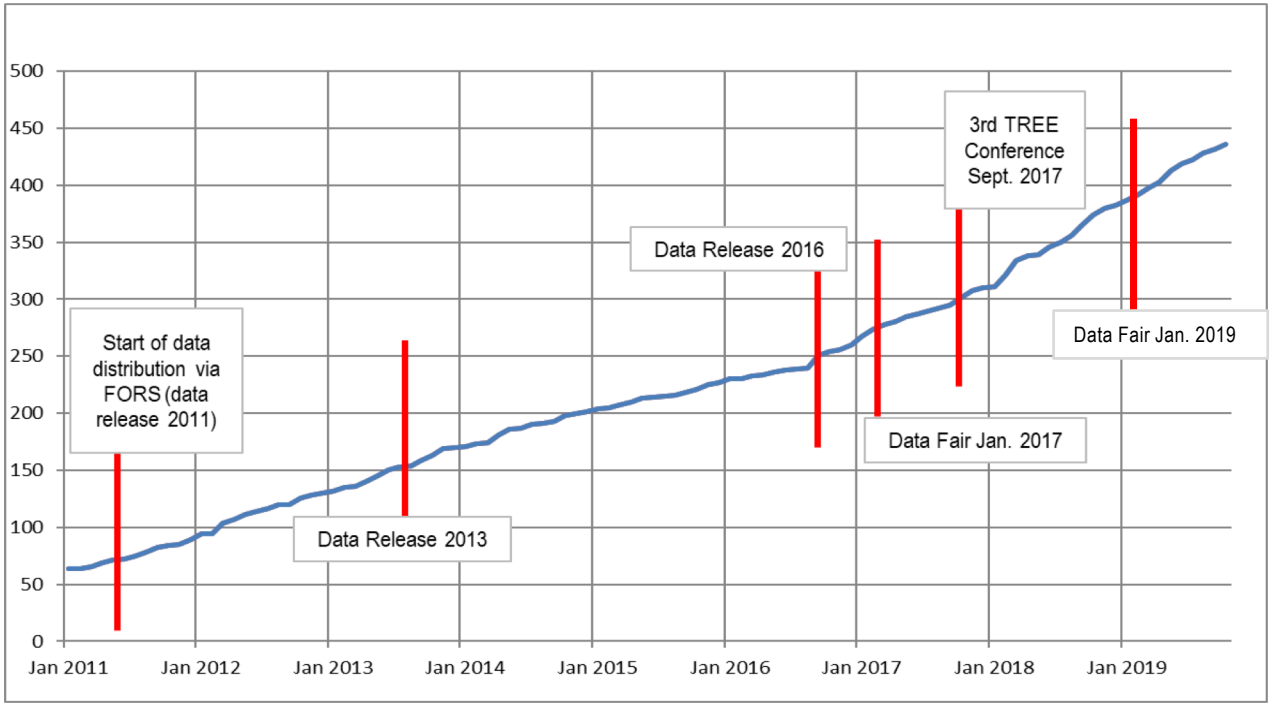
2nd cohort (TREE2)

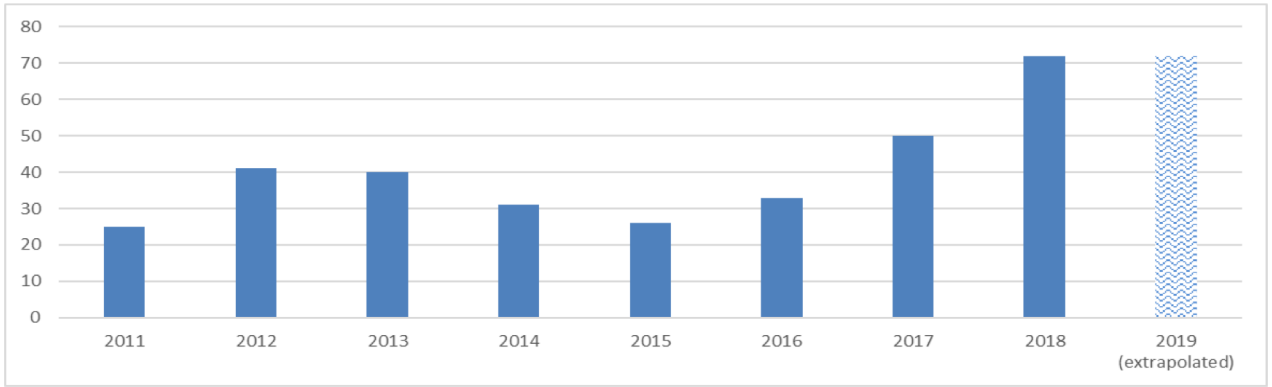
- Replication of TREE1 (with some extensions, adjustments and improvements)
- Baseline survey: Assessment of the Attainment of Educational Standards (AES; national standardised math test 9th grade)
- Larger and more balanced sample than TREE1 (gross initial sample N ≈ 10'000)
- Response wave 3/2019: approx. 6.000 respondents
- Expected response for wave 4/2020: approx. 5.200 respondents
- First data available by October 2020 (baseline, waves 1 and 2)

TREE2 as a base survey for complementary studies («Lego» design)



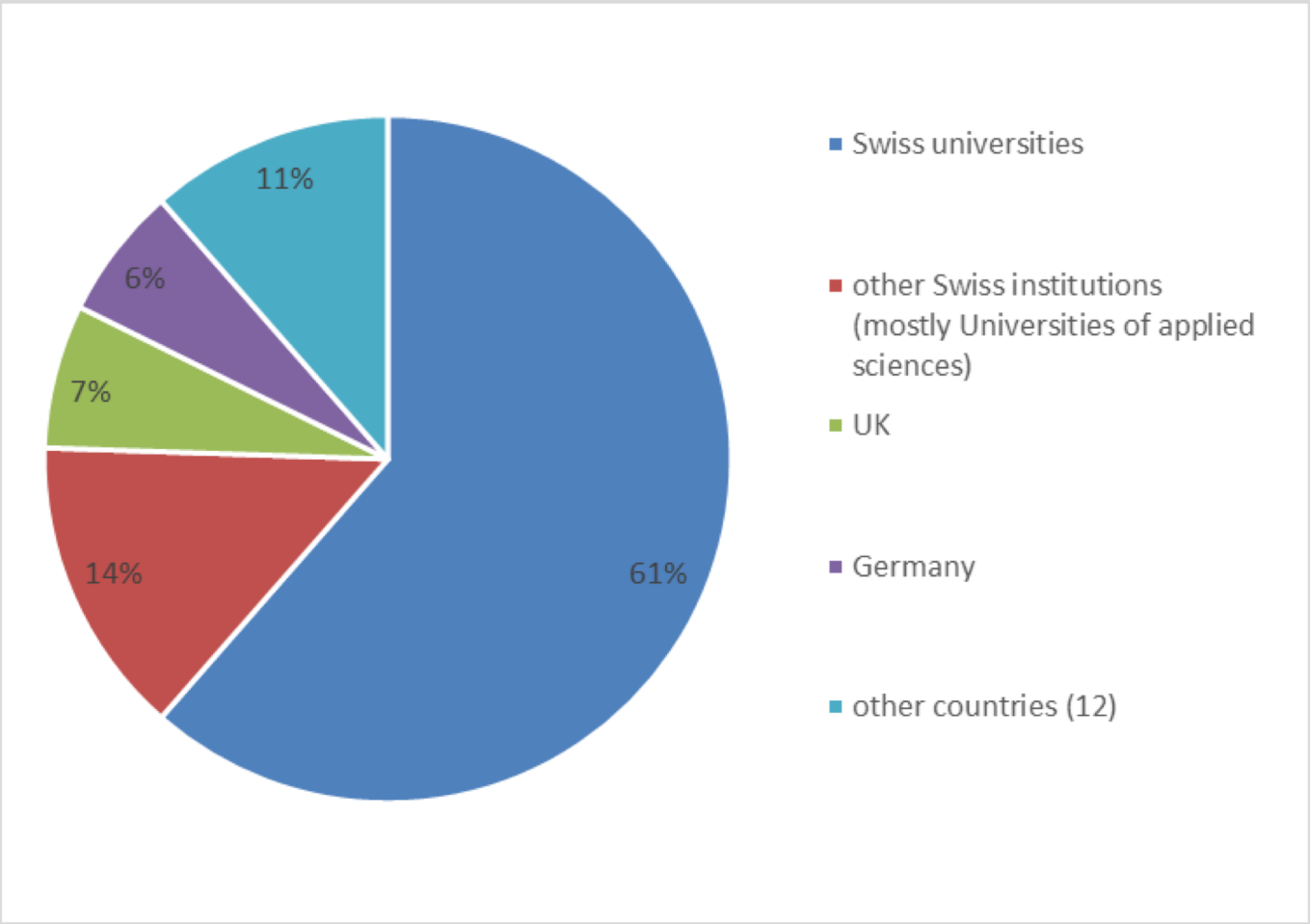
TREE data use: cumulative development 2010-2019



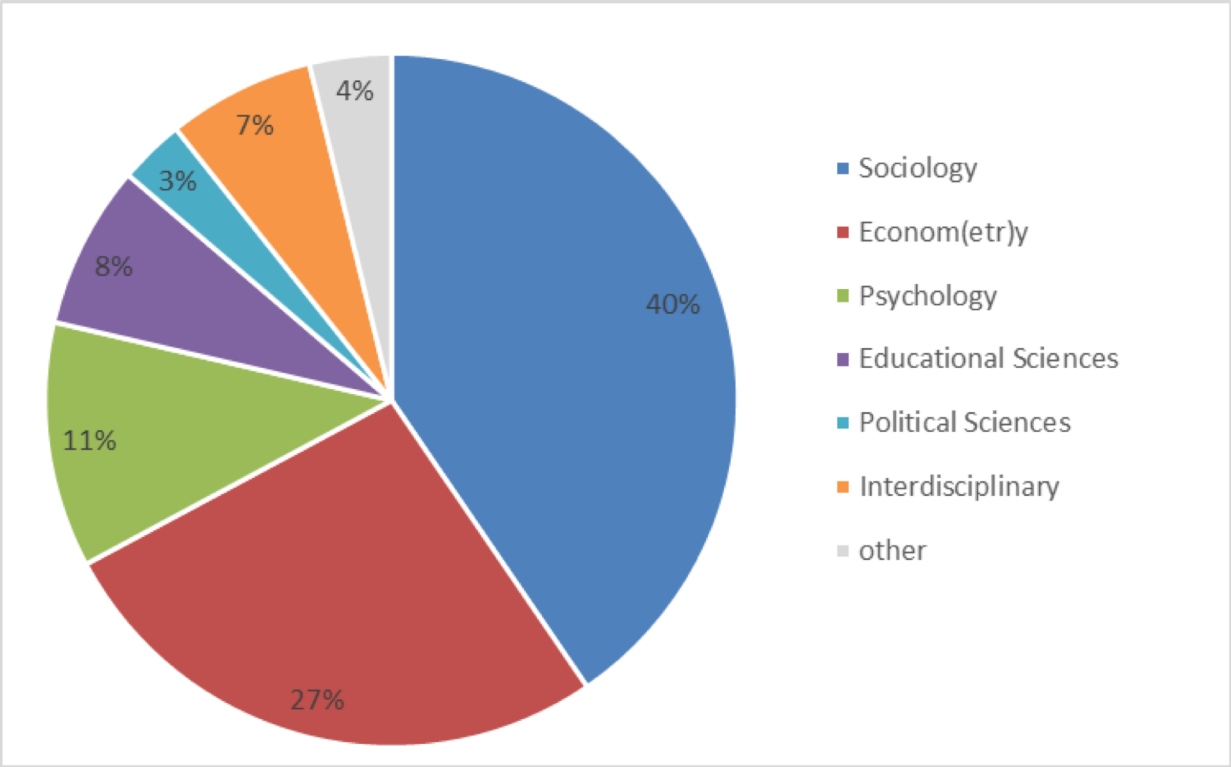


- National "Social science infrastructure"
- Among 5 most widely used datasets in Switzerland

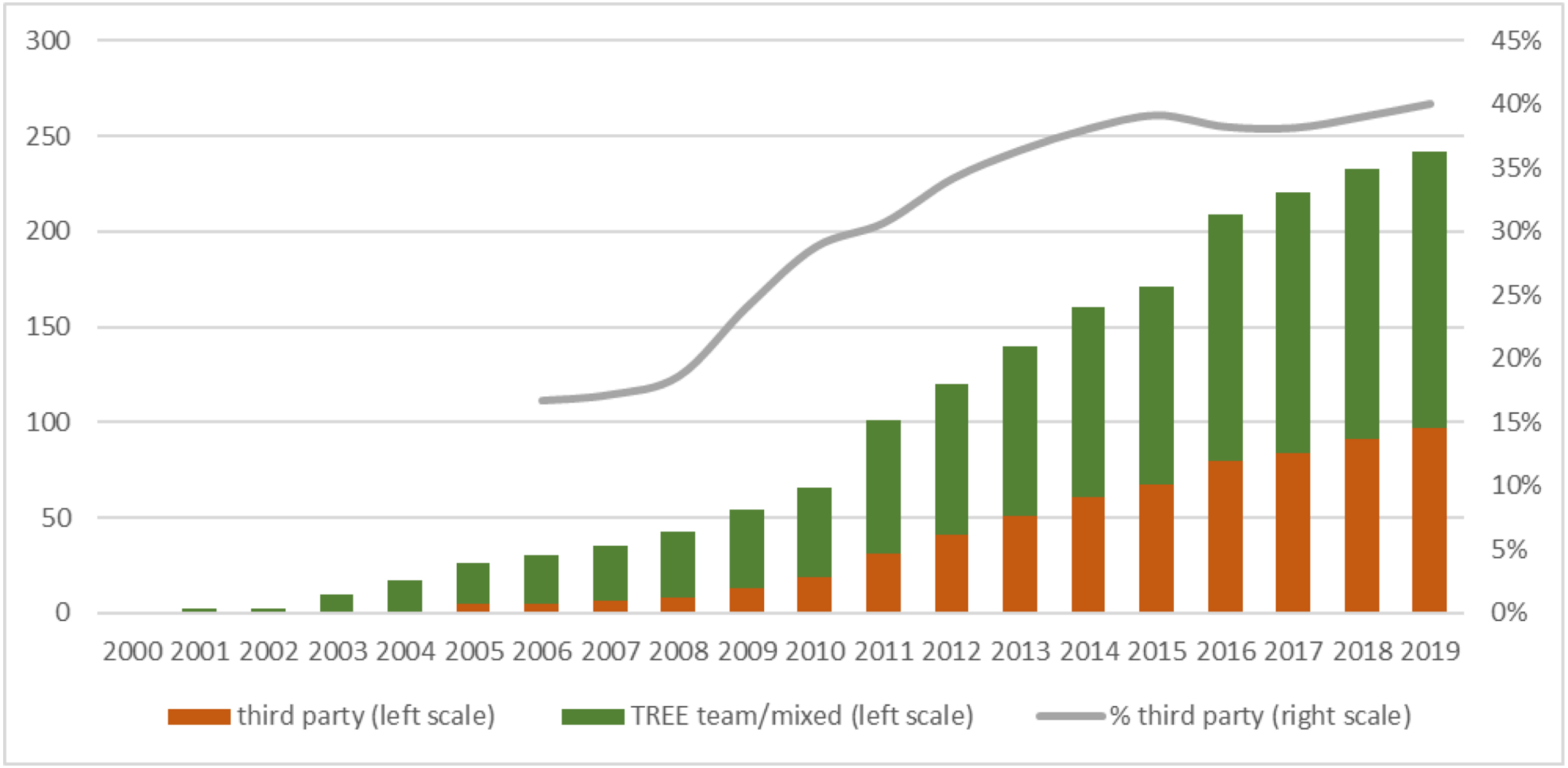
TREE data use 2016-2019 by institution/country



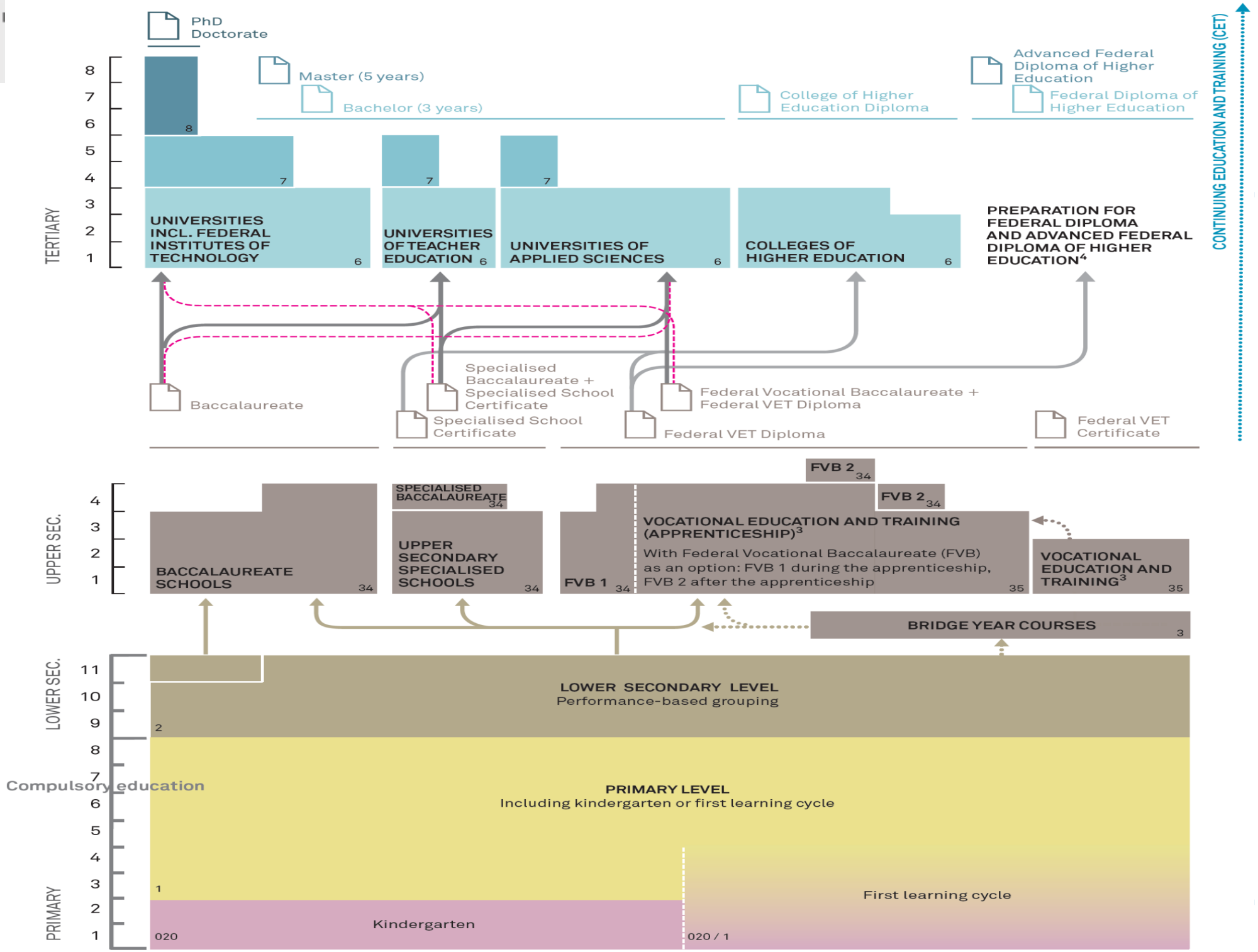
TREE data use 2016-2019 by discipline/field of research



Publications based on TREE data: cumulative development 2000-2019



Full bibliography: www.tree.unibe.ch/results

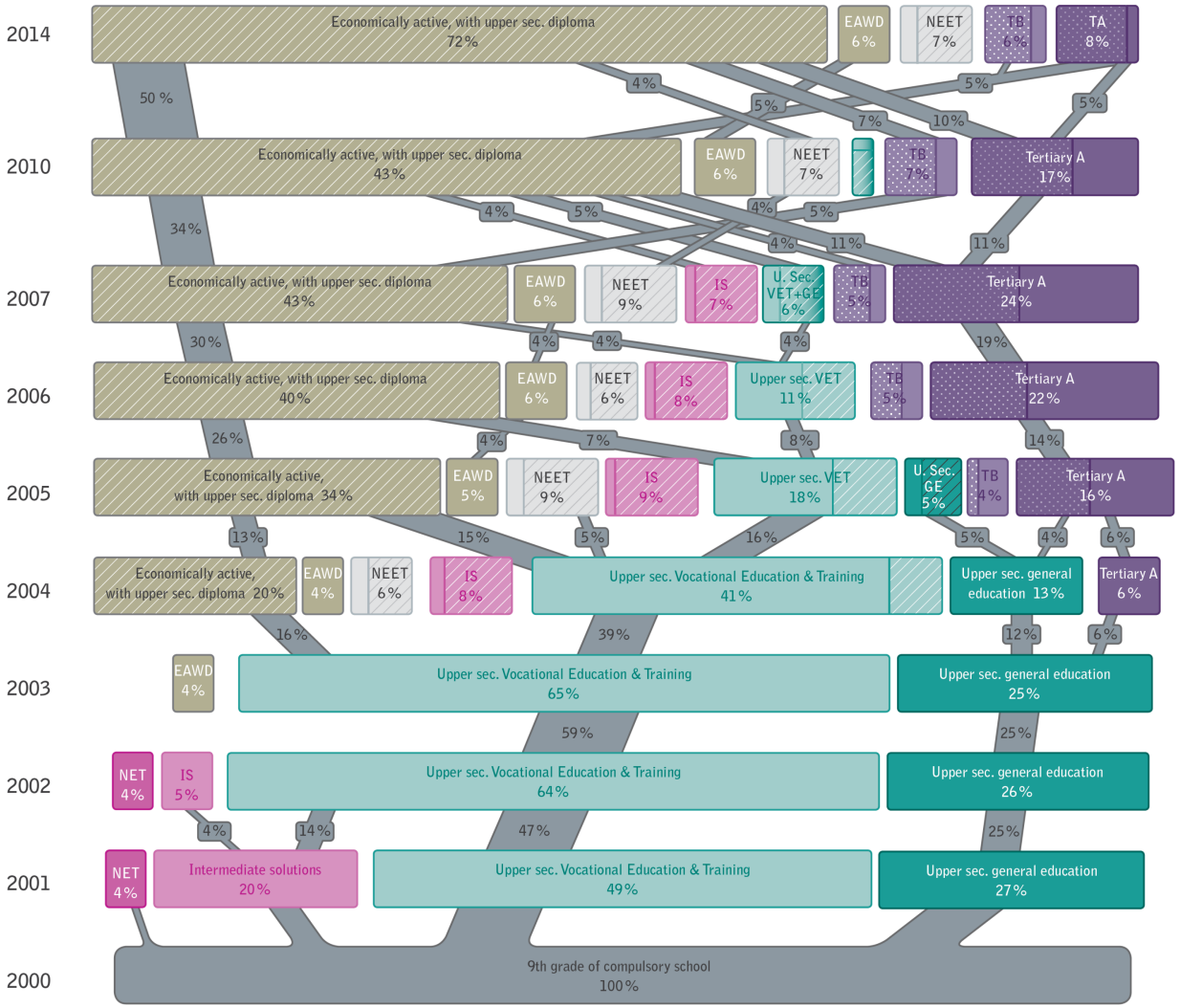

PhD
Doctorate
Master (5 years)
Bachelor (3 years)
College of Higher Education Diploma
Advanced Federal Diploma of Higher Education
Federal Diploma of Higher Education
TERTIARY
8
7
6
5
4
3
2
1
UNIVERSITIES INCL. FEDERAL INSTITUTES OF TECHNOLOGY 6
UNIVERSITIES OF TEACHER EDUCATION 6
UNIVERSITIES OF APPLIED SCIENCES 6
COLLEGES OF HIGHER EDUCATION 6
PREPARATION FOR FEDERAL DIPLOMA AND ADVANCED FEDERAL DIPLOMA OF HIGHER EDUCATION[4]
CONTINUING EDUCATION AND TRAINING (CET)
Baccalaureate
Specialised Baccalaureate + Specialised School Certificate
Specialised School Certificate
Federal Vocational Baccalaureate + Federal VET Diploma
Federal VET Diploma
Federal VET Certificate
UPPER SEC.
4
3
2
1
FVB 2 34
SPECIALISED BACCALAUREATE 34
FVB 2 34
BACCALAUREATE SCHOOLS 34
UPPER SECONDARY SPECIALISED SCHOOLS 34
FVB 1 34
VOCATIONAL EDUCATION AND TRAINING (APPRENTICESHIP)[3]
With Federal Vocational Baccalaureate (FVB) as an option: FVB 1 during the apprenticeship, FVB 2 after the apprenticeship 35
VOCATIONAL EDUCATION AND TRAINING[3] 35
BRIDGE YEAR COURSES 3
LOWER SEC.
11
10
9
8
7
6
5
4
3
2
1
LOWER SECONDARY LEVEL
Performance-based grouping
2
Compulsory education
PRIMARY LEVEL
Including kindergarten or first learning cycle
1
PRIMARY
Kindergarten
020
First learning cycle
020 / 1

The Swiss education system: some macro-context characteristics

- Marked institutional heterogeneity (26 cantonal school systems, 4 official languages)
- Early and strong segregation/"tracking" (lower sec., but also horizontal segregation at upper secondary and tertiary levels)
- Marked and unequalled predominance of dual VET at upper sec. level, strong separation between VET and general education
- Relatively high completion rate (90%) at upper secondary level, but low to medium rates at (academic) tertiary level

Some key findings from TREE1 (first cohort)

Comprehensive, multi-dimensional view on pathways



- "bottleneck" situation at the transition from lower to upper secondary education (mostly due to lack of VET training places ("Lehrstellenkrise")
- Marked predominance of VET at upper sec. level (two thirds), as opposed to only 25% in general education
- No permeability between VET and general education system
- Markedly "scattered" transition from upper sec. VET to labour market or tertiary level education
- "multiple"/"reverse" transitions between education and work
- Relatively low participation in tertiary level education
- Gradual labour market integration from 2003/4 on to 2014 (approx. 80% employed without being enrolled in an educational programme)

Strong stratification of education system

Officially, the Swiss education system declares itself as being equitable and permeable. However, we observe that

- Tracking at lower sec. level is strong and hardly reversible
- At upper secondary level, the system is also strongly stratified/tracked, on the one hand between general education and VET, on the other hand within VET itself

Thresholds and obstacles in a strongly stratified education system

- High degree of discontinuity throughout post-compulsory pathways, particularly at the transition between lower and upper sec. level and within upper sec. level;
- System efficiency problem, i.e. average age of 1st VET degree (at upper sec. level) is at almost 23 years.
- Discontinuity as a risk "per se": Discontinuous pathways generate (ceteris paribus) increased early dropout

The long shadow of early tracking

The strong tracking at lower sec. level…

- is hard to reverse/correct even for gifted students in the "low-achievers" tracks;
- is reinforced by the strongly stratified upper sec. education system ("creaming-off" of general education system [Gymnasium] with very restricted access, but also of VET professions with high academic requirements;
- "translates" into low to non-existent access to tertiary level education for students in "low-achieving" tracks/programmes

Poor marks with regard to equity

- Strong impact (ceteris paribus, net of academic achievement) of "ascriptive" student characteristics such as social status, gender and migration background;
- Cumulative (dis-)advantages ("Matthew effect") throughout the various levels of education;
- Particularly strong gender effects at all levels of education;
- VET system reinforces gender-stereotyped educational and occupational choices;
- "doing gender" early on: young men and women anticipate their gender-roles as early as at the point of transition from lower to upper secondary education

"Tertiarisation problem" of VET

- Strong demand of tertiary level qualification in the labour market
- Low enrolment rates of VET graduates at tertiary level education, particularly those with restricted academic programmes at vocational school
- Marked compensation of "unmet demand" by transnational labour migration

Labour market outcomes: favourable, but…

- Overall, favourable labour market integration for all levels of educational credentials (even for those without post-compulsory degrees) – not least due to steadily favourable macro-economic conditions
- Shift of "level of distinction" from upper secondary to tertiary level of education
- Decreasing "protective" effects of upper sec. VET degrees: VET professions with low academic requirements tend to incur similar difficulties with regard to labour market success as those without post-compulsory degrees
- Limited mobility of VET graduates between professions/occupations (often accompanied by wage penalties) → "thin ice" in the event of deterioration of labour market conditions/economic downturn
- (unexplained) wage gaps between men and women from the very start of their professional career
- "traditionalisation" of gender roles starting at the moment of family formation

First results from cohort 2 (TREE2)

Why do women so rarely become STEM professionals?

- Since decades, Switzerland has a shortage of professionals in STEM occupations (Science, Technology, Engineering, Mathematics).
- Furthermore, there is huge gender gap in STEM.
- Consequently, there is a lot of educational policy to make STEM training more attractive for females.
- But why do women so rarely decide to become a STEM professional?
- One explanation might be that women are not good at math. Well, who knows? It seems obvious that the process of acquiring math skills is not free from the influence of gender stereotypes.
- Furthermore, we argue that gender stereotypes also affect the self-concept, and that the self-concept is important for educational decisions.
- In particular, we suspect that women underestimate their math skills compared to men and that this underestimation makes them likely to decide against STEM education.

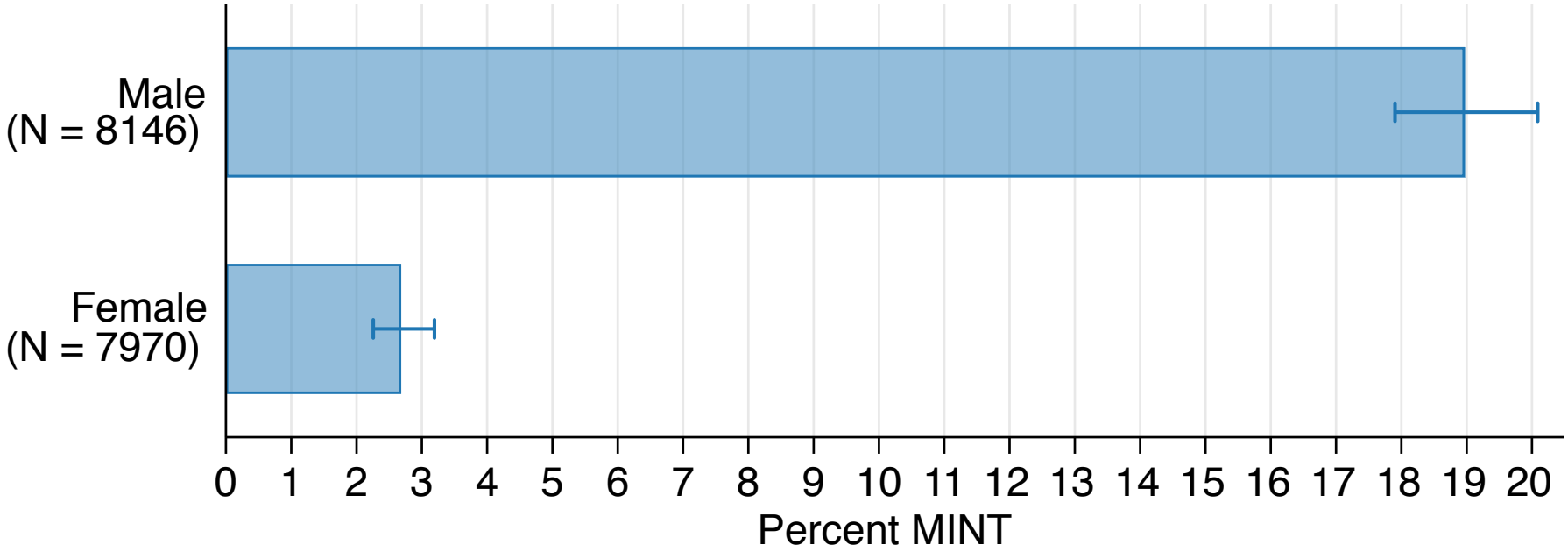
(Jann/Hupka-Brunner, 2020; forthcoming in the Swiss Journal of Educational Research)

Why do women so rarely become STEM professionals?

- Data:
  - TREE2 wave 0: Baseline measurement of math skills, mathematical self-concept, and occupational aspirations among a sample of over 20'000 school leavers in 2016 (at age 15).
  - TREE2 wave 1: Information on actual educational situation 1 year after leaving school.
  - Math skills: extensive math tests covering the Swiss curriculum (2 hours); we use the WLE scores (the tests were used for the Swiss Assessment of the Attainment of Educational Standards).
  - Mathematical self-evaluation: Using two measures, a rather general "self-concept" ("I am good at math" etc.) and a specific "self-efficacy" measure ("How likely can you solve the following tasks?")
  - STEM aspiration (wave 0): classification of the "job at the age of 30" into STEM professionals (at level of tertiary education) and other occupations; respondents for which no information on the job at 30 is available ("don't know") will be excluded from analysis (no gender bias).
  - STEM education (wave 1): classification of current educational track into tracks that likely lead to a STEM profession and other tracks

Why do women so rarely become STEM professionals?

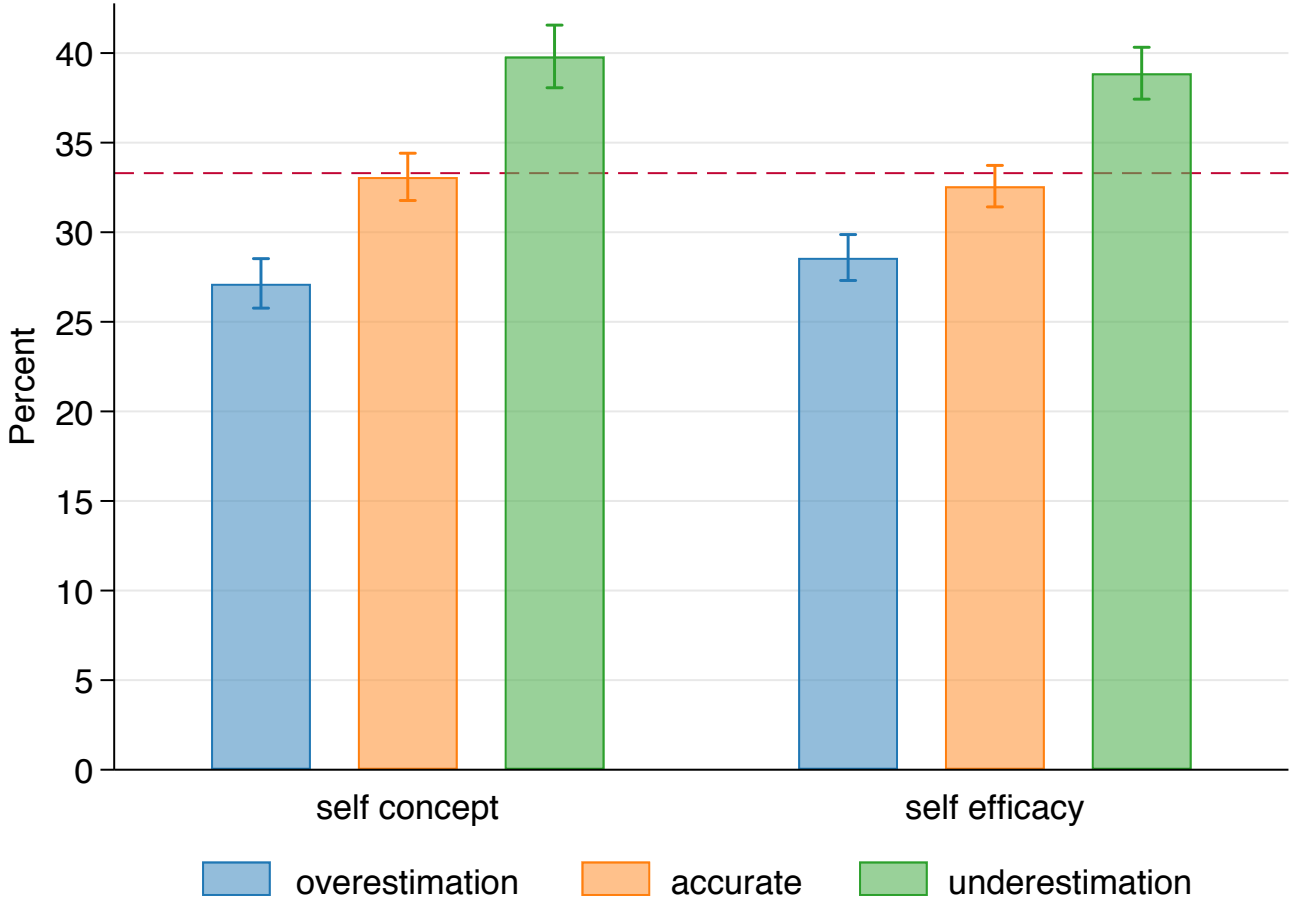
- Results: Gender gap in MINT aspirations (job at 30)



- Gender difference is about 16 percentage points

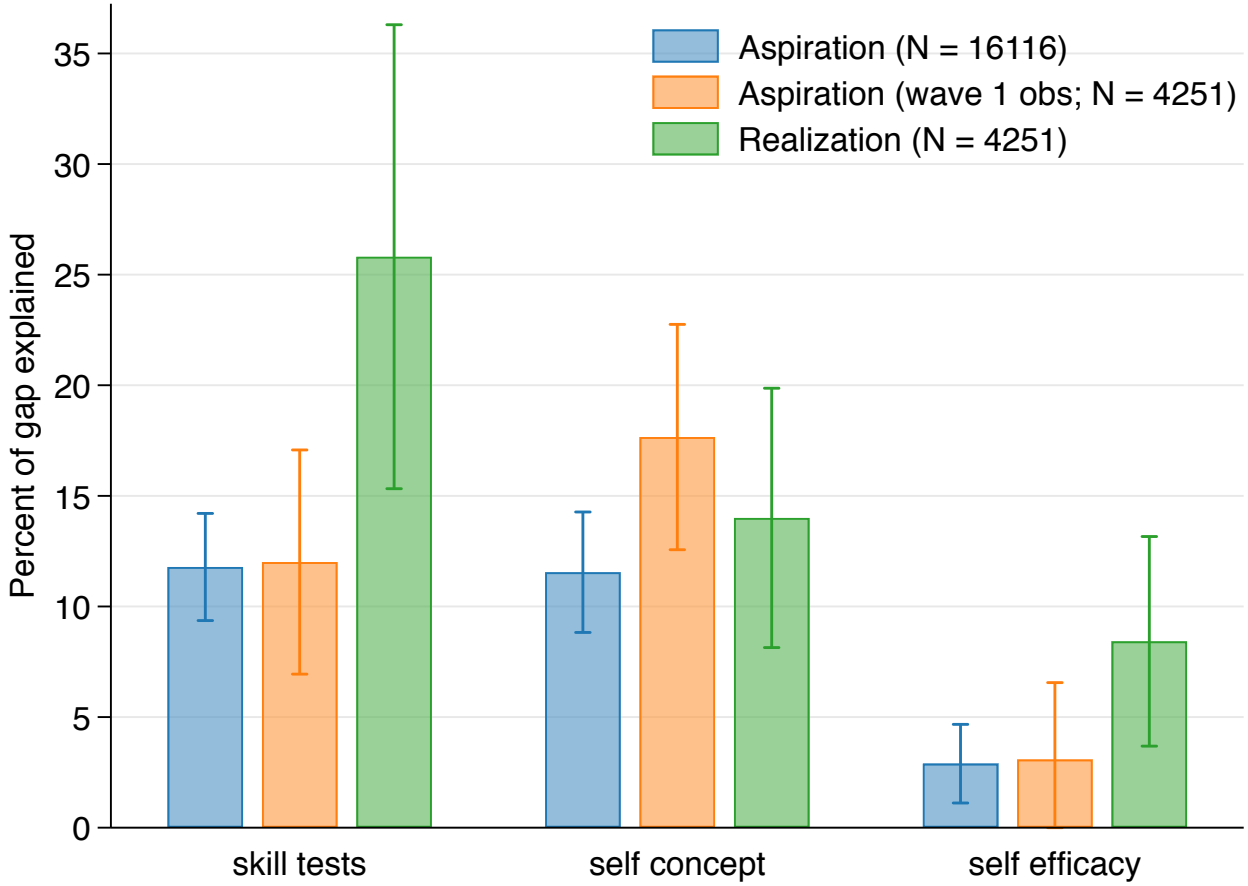
Why do women so rarely become STEM professionals?

- Results: mathematical self-evaluation (distribution of females across terciles of rank differences between skills and self-evaluation)



Why do women so rarely become STEM professionals?

- Results: explanation of STEM gender gap (OB decomposition) (using ranks differences between skills and self-evaluation as predictors)



Why do women so rarely become STEM professionals?

- Skill differences explain some of the gender gap in STEM aspirations/choice (although, of course, these skill differences may be a result of stereotypes that affect learning behavior).
- Over and above the actuals skills, also the self-evaluation of these skills play an important role: females are less likely to choose STEM because they underestimate their skills compared to men.
- The general self-concept seems more important for aspirations; for the realized educational choice, the specific self-efficacy is more important.

Why do women so rarely become STEM professionals?

- Further evidence on the mechanisms behind the gender STEM gap is provided by a choice experiment included in wave 2 of TREE2.
- The experiment has been designed by Benita Combet, an external researcher.
- Only a subsample of the respondents took part in the experiment (respondents enrolled in "Gymnasium")
- The survey experiment asked respondents to choose between different fields of study that were described along different dimensions (the experimental factors).
- The effects of these dimensions on the choice reveal the preferences of the respondents for different aspects.

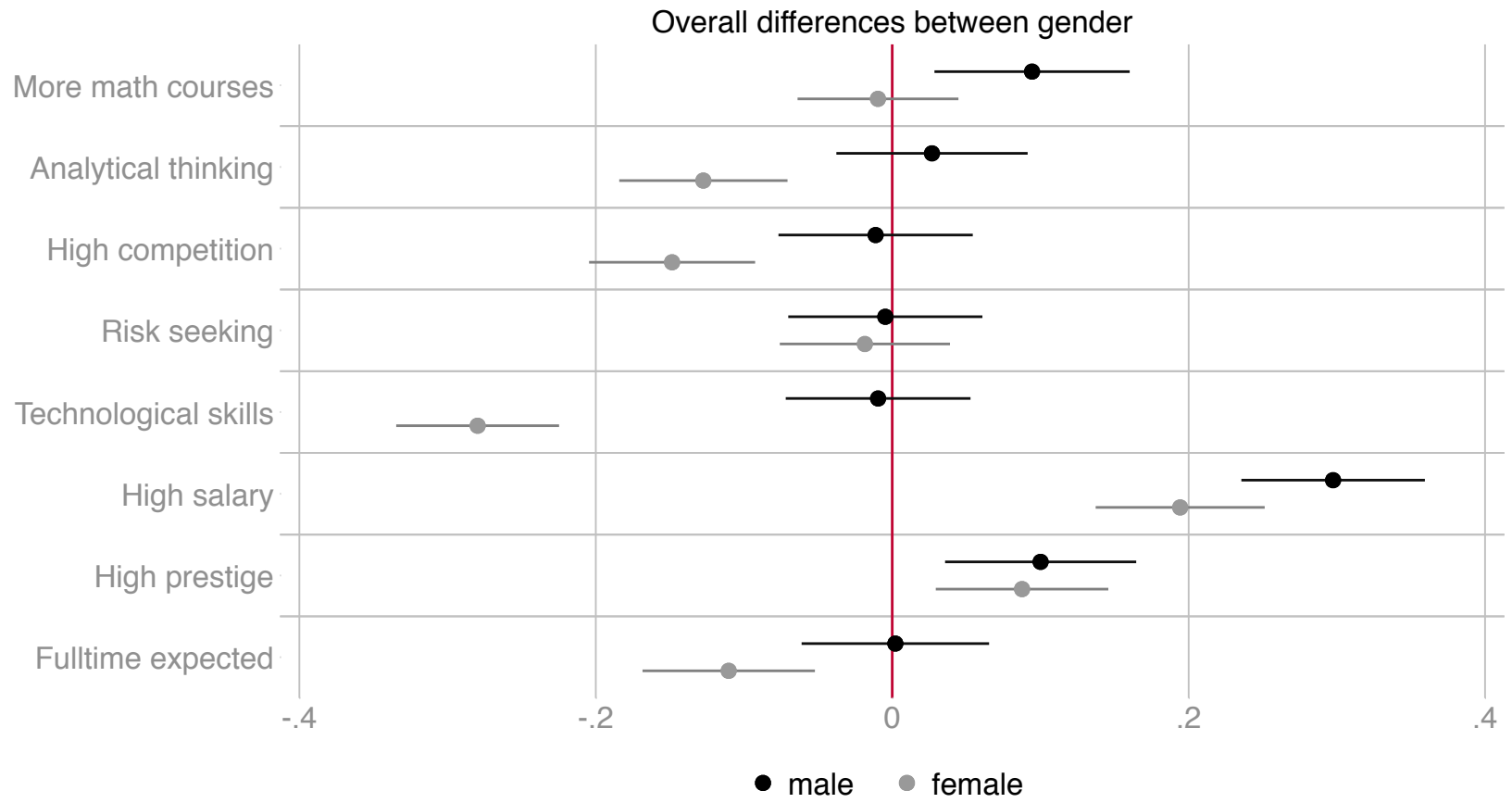
I'm sure you've already thought about what you'd like to do after graduating from high school. Below you will find two descriptions of possible fields of study.

Which of these subjects would you be more interested in, A or B?

	Subject A	Subject B	**Preference for:**
Characteristics of the subject			
Mathematics is an important part of the subject	rather no	rather yes	Mathematics
The subject primarily requires ...	associative and creative thinking	analytical and systematic thinking	Thinking style
Competition among students is ...	low	high	Competition
Characteristics of the profession the subject is preparing for:			
The risk of not finding a suitable entry job within one year is ...	average	low	Risk
Important professional skills are ...	compassion and social skills	flair for technology and engineering	Systemizing vs. empathizing
The monthly salary is in comparison to other subjects	average	high	Income
The reputation of the profession in Switzerland is	average	high	Prestige
Workloads below 60% are ...	most of the time	hardly possible	Part-time work

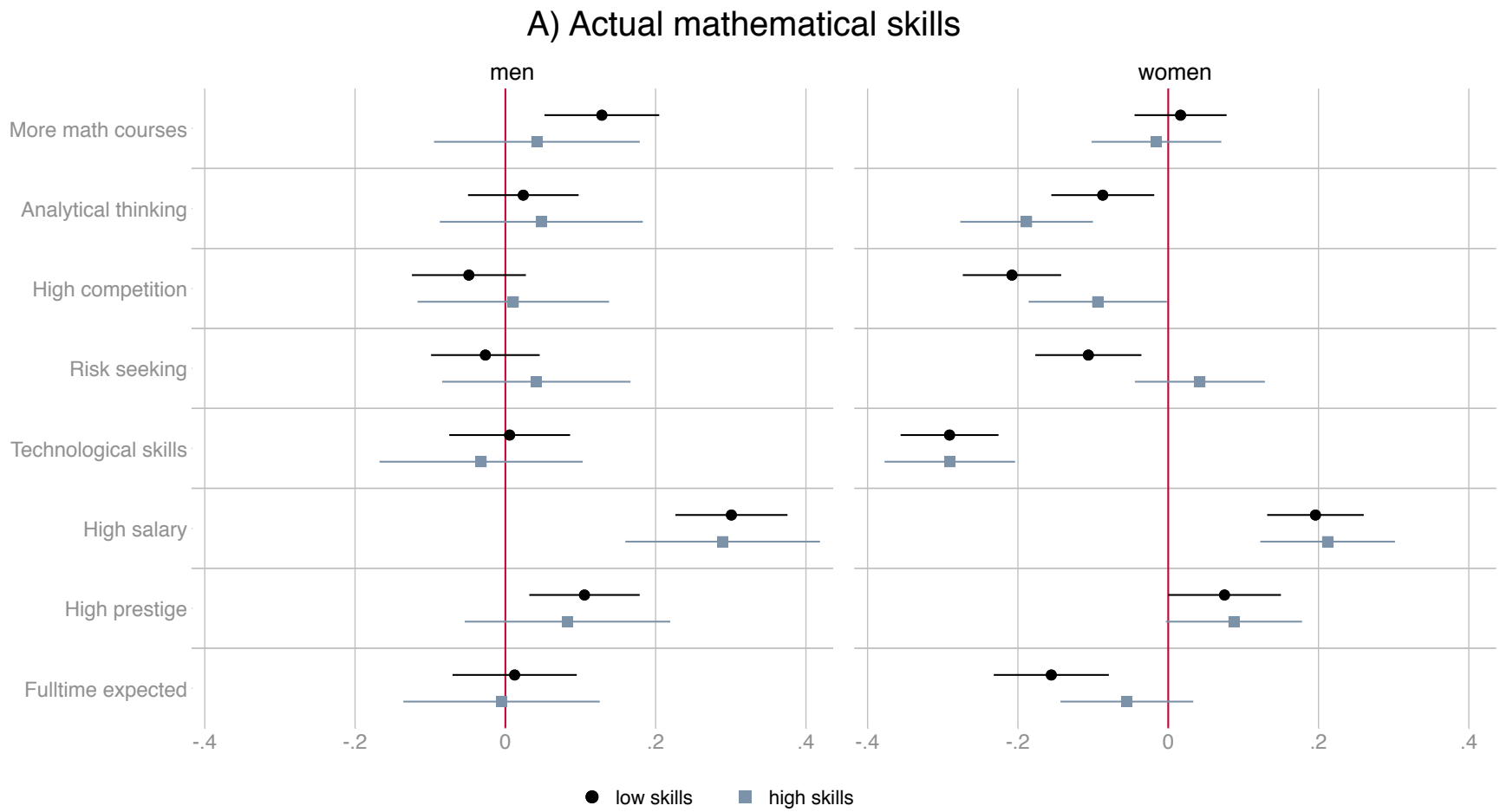
Which of these subjects would you be more interested in?	A ☐	B ☐

Which preferences determine their choice in the experiment? Do men and women differ in their preferences?



Bootstraped differences:
math: -0.10, p = 0.055; analy. think.: -0.15, p = 0.006; competition: -0.14, p = 0.010; risk: -0.01, p = 0.807; skills: -0.27, p < 0.001; salary: -0.10, p = 0.038; prestige: -0.01, p = 0.810; fulltime: -0.11, p = 0.023

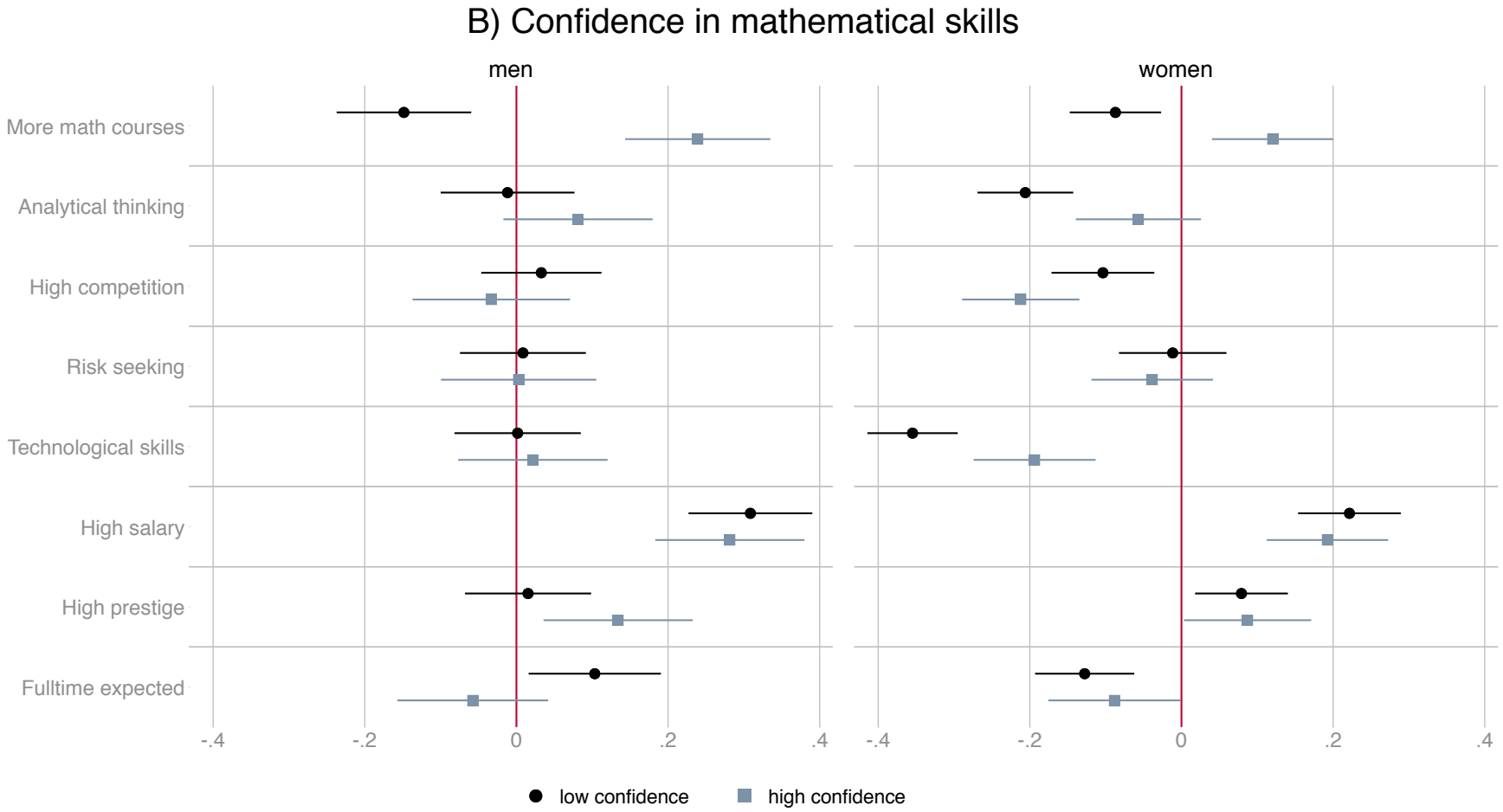
What is the relationship between mathematical skills and the preferences of men and women?



Bootstrapped difference:
Women risk: 14.8, p = 0.022

Correlation btw. sex and skills: 0.05, p = 0.058

What is the relationship between confidence in mathematical skills and the preferences of men and women?



Correlation btw. sex and confidence: -0.22, $p < 0.001$

Bootstrapped difference:

Men: time: 16.1, p = 0.077

Women: analyt: 14.9, p = 0.023; competition: -10.8, p = 0.111; technol. skills: 17.1, p = 0.008

Why do women so rarely become STEM professionals?

- Men and women strongly differ in their preferences for different aspects associated with a field of study. These differences are in line with common gender stereotypes.
- Interestingly, the preferences are largely independent from the actual math skills of the respondents.
- However, the preferences are related to the mathematical self-concept of the respondents (especially for women).
- That is, women's lower preference for STEM fields is strongly related to their lower confidence in their mathematical skills, independently from their true skills.
- The difference in the self-concept is most likely due to gender stereotypes; hence, at least part of the gender STEM gap is due to gender stereotypes that affect women's confidence in their own skills.

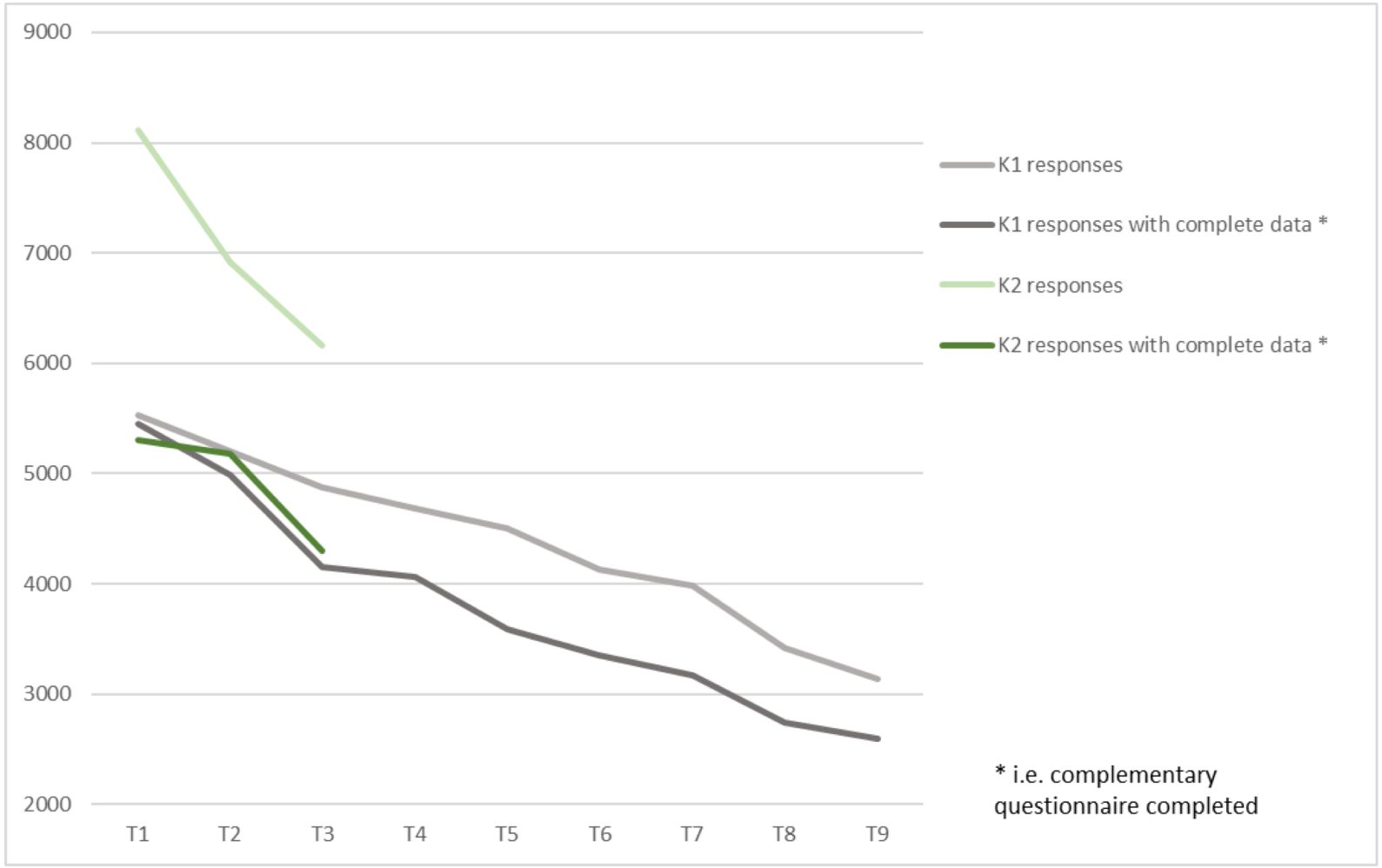
Outlook

- Cohort 1: long-term labour market career development (age 35 and beyond), family <-> work balance, gendered professional careers
- Cohort 2 (also/always compared to cohort 1)
  - VET pathways: changes due to overall demographic, institutional and labour/apprenticeship market conditions (e.g. from "Lehrstellenkrise" to "Lehrlingsmangel");
  - Access/transition to tertiary level education
  - "genderisation" of educational and labour market pathways
  - Outcomes other than labour market success: health, social integration, politics, well-being
- Cross-national comparisons
- Effects of the Corona crisis?

Limitations & challenges

- Sparse information about actors other than students/young people, i.e. teachers, training firms, schools, parents, peers, etc. → linkage to register data, "add-on" mixed-methods studies
- Time lag of results due to cohort character of survey: by the time we present results (particularly the long-term ones), they are "outdated"
- School leavers' survey: starts too late, cannot (directly) observe what happens throughout earlier stages of educational pathways/careers
- Deterioration/erosion of survey participation: How long can we follow up which cohort (sample power)?

Methodological issues: sample/panel attrition



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Thank you for your attention!

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